

CONSISTENCY MEETING

Date: 3/12/2014

DEPARTMENTAL GOALS:

- 85 - 90 % 1 DAY TURN AROUND
- 80 - 85 % CONTRACTOR PASS RATE
- **QUALITY INSPECTIONS!**
- **EXCELLENT CUSTOMER SERVICE!**

SAFETY ISSUES:

REMEMBER COUNTY CELL PHONE POLICY, USE ALL APPROVED SAFETY EQUIPMENT ISSUED TO YOU. (i.e. HARDHAT, SAFETY GLASSES, SAFETY SHOES, PPE)

Q: WHY ARE WE HERE? A: TO SERVE THE CUSTOMER

Consistency Questions

1. Is it permissible to sleeve SER cable in PVC from an outdoor panel into a crawl space? (Chris Dellinger)

Yes, the key word here is sleeve. See 338.10(B)(4)

SERVICE-ENTRANCE CABLE (TYLZ)

GENERAL

This category covers service-entrance cable designated Type SE and Type USE for use in accordance with Article 338 of ANSI/NFPA 70, "National Electrical Code" (NEC).

Service-entrance cable, rated 600 V, is certified in sizes 14 AWG and larger for copper, and 12 AWG and larger for aluminum or copper-clad aluminum.

The cable is designated as follows:

Type SE — Indicates cable for aboveground installation. Both the individual insulated conductors and the outer jacket or finish of Type SE are suitable for use where exposed to sun. Type SE cable contains Type RHW, RHW-2, XHHW, XHHW-2, THWN or THWN-2 conductors. Maximum size is 4/0 AWG copper or 300 kcmil aluminum or copper-clad aluminum.

Types USE and USE-2 — Indicates cable for underground installation including direct burial in the earth. Maximum size is 2000 kcmil. Cable in sizes 4/0 AWG copper, aluminum or copper-clad aluminum and smaller and having all conductors insulated is suitable for all of the underground uses for which Type UF cable is permitted by the NEC. Multiconductor Type USE cable contains conductors with insulation equivalent to RHW or XHHW. Multiconductor Type USE-2 contains insulation equivalent to RHW-2 or XHHW-2 and is rated 90°C wet or dry. Single- and multiconductor Types USE and USE-2 are not suitable for use in premises. Single- and multiconductor Types USE and USE-2 are not suitable aboveground except to terminate at the service equipment or metering equipment. Both the insulation and the outer covering, when used, on single- and multiconductor Types USE and USE-2, are suitable for use where exposed to sun.

2. How do you ground Service Equipment in more than 1 enclosure-or Subpanel (Gerald Barnes)

3. In a dwelling, do the receptacles installed in an appliance garage have to be GFCI protected? (David Rains)

Yes see 210.8. While these receptacles don't count as the required countertop receptacles, they still serve the countertop space none the less.

4. I have an outdoor floodlight controlled by a switch located in the living room. Since the lighting outlet is located outside the living room, would this have to be on an AFCI circuit? (Matt King)

(A) Dwelling Units. All 120-volt, single phase, 15- and 20-ampere branch circuits supplying outlets installed in...

No there are no requirement for AFCI protection on outdoor *OUTLETS*

Outlet. A point on the wiring system at which current is taken to supply utilization equipment.

5. Is a Butler's Pantry required to be on small appliance circuit, GFCI, and/or AFCI? (Craig Sloop)

In the Interpretations White Book pg 7.5 is being changed as follows:

Per 210.8(A)(6) & (7), 210.11(C)(1), 210.12, and 210.210.52 (B) (1) & (C) of the code, if the butler's pantry is located in the kitchen it is required that all spacing and GFCI protection be met, the same as all other kitchen countertops. If the butler pantry is located outside of the kitchen (i.e. dining room or hallway) it will be required to be on AFCI as well as small appliance branch circuit.

6. Please clarify GFCI protected circuitry for "Temporary Utilities" installations (Joe Weathers)

10.8 Temporary Power

10.8.1 Scope. The provisions of this section apply to the utilization of portions of the wiring system within a building to facilitate construction.

10.8.2 Provisions for Temporary Power. The Code enforcement official shall give permission and issue a permit to energize the electrical service when the provisions of 10.8 and the following requirements have been met:

1) The service wiring and equipment, including the meter socket enclosure, shall be installed, the service wiring terminated, and the service equipment covers installed.

2) The portions of the electrical system that are to be energized shall be complete and physically protected.

3) The grounding electrode system shall be complete.

4) The grounding and the grounded conductors shall be terminated in the service equipment.

5) At least one receptacle outlet with ground fault circuit interrupter protection for personnel shall be installed with the circuit wiring terminated.

6) The applicable requirements of the North Carolina Electrical Code apply.

10.8.3 Uses Prohibited. In no case shall any portion of the permanent wiring be energized until the portions have been inspected and approved by an electrical Code Enforcement Official.

Failure to comply with this section may result in disconnection of power or revocation of permit.

590.6 Ground-Fault Protection for Personnel. Ground fault protection for personnel for all temporary wiring installations shall be provided to comply with 590.6(A) and (B). This section shall apply only to temporary wiring installations used to supply temporary power to equipment repair, or demolition of buildings, structures, equipment, or similar activities. This section shall apply to power derived from an electric utility company or from an on-site-generated power source.

(A) Receptacle Outlets. Temporary receptacle installations used to supply temporary power to equipment used by personnel during construction, remodeling, maintenance, repair, or demolition of buildings, structures, equipment, or similar activities shall comply with the requirements of 590.6(A)(1) through (A)(3), as applicable.

Exception: In industrial establishments only, where conditions of maintenance and supervision ensure that only qualified personnel are involved, an assured equipment grounding conductor program as specified in 590.6(B)(2) shall be permitted for only those receptacle outlets used to supply equipment that would create a greater hazard if power were interrupted or having a design that is not compatible with GFCI protection.

(1) Receptacle Outlets Not Part of Permanent Wiring.

All 125-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets that are not a part of the permanent wiring of the building or structure and that are in use by personnel shall have ground-fault circuit-interrupter protection for personnel.

(2) Receptacle Outlets Existing or Installed as Permanent Wiring.

Ground-fault circuit-interrupter protection for personnel shall be provided for all 125-volt, single-phase, 15-, 20-, and 30-ampere receptacle outlets installed or existing as part of the permanent wiring of the building or structure and used for temporary electric power. Listed cord sets or devices incorporating listed ground-fault circuit interrupter protection for personnel identified for portable use shall be permitted.

7. Is it permissible to use compression fittings on EMT in wet locations or do they have to be listed as rain tight? (Chris Dellinger)

It is permissible and they do have to be listed rain tight. See (FKAV) pg 151 in the 2013 UL White Book:

ELECTRICAL METALLIC TUBING FITTINGS (FKAV)

GENERAL

This category covers electrical metallic tubing fittings such as connectors, couplings and expansion fittings, from 1/2 to 4 (metric designators 16 to 103) inclusive trade sizes, intended for installation and use in accordance with the following information and the limitations specified in Electrical Metallic Tubing (FJMX).

All male threaded fittings have only been investigated for use with locknuts.

Indentor Fittings — Indentor-type fittings are for use with metallic-coated electrical metallic tubing only and require a special tool supplied by the manufacturer for proper installation. Diametrically opposed indentor-type tools require two sets of indentations nominally 90° apart. Triple-indent tools require one set of indentations.

Grounding — These fittings are considered suitable for grounding for use in circuits over and under 250 V and where installed in accordance with ANSI/NFPA 70, "National Electrical Code."

Reusability — Fittings have not been investigated for reusability. Reusability should be determined by the installer and the Authority Having Jurisdiction.

PRODUCT MARKINGS

Fittings suitable for use in poured concrete or where exposed to rain are so indicated on the device or carton. The term "rain tight," "wet location" or the equivalent on the carton indicates suitability for use where directly exposed to rain. The term "concrete tight" or equivalent on the carton indicates suitability for use in poured concrete.

Fittings have been tested for use only with steel tubing unless marked on the device or carton to indicate suitability for use with aluminum or other material.

CARTON MARKINGS

A fitting that is taped completely (from the raceway to the box, or raceway to raceway) is concrete-tight when the product carton is marked "CONCRETE-TIGHT WHEN TAPED."

ADDITIONAL INFORMATION

For additional information, see Electrical Metallic Tubing (FJMX) and Electrical Equipment for Use in Ordinary Locations (AALZ).

REQUIREMENTS

The basic standard used to investigate products in this category is ANSI/UL 514B, "Conduit, Tubing, and Cable Fittings."

UL MARK

The UL symbol on the product and the Listing Mark of UL on the smallest unit container in which the product is packaged is the only method provided by UL to identify products manufactured under its Listing and Follow-Up Service. The Listing Mark for these products includes the UL symbol (as illustrated in the Introduction of this Directory) together with the word "LISTED," a control number, and the product name "Electrical Metallic Tubing Fitting" (or "EMT Fitting"), "Connector" or "Coupling," or other appropriate product name as shown in the individual Listings.

* * * * *

UL, in performing its functions in accordance with its objectives, does not assume or undertake to discharge any responsibility of the manufacturer or any other party. UL shall not incur any obligation or liability for any loss, expense or damages, including incidental or consequential damages, arising out of or in connection with the use, interpretation of, or reliance upon this Guide Information.

8. I have been turned down several times lately for my conduits to LED pool lights being covered before inspection. The pools are 1 piece fiberglass pools and must be backfilled and filled with water immediately after setting in place. Is it really necessary to see these conduits since they only contain a 12V low voltage cable? (Matt King)

Yes this is necessary. There is nothing in articles 300 or 411 or 680 that say this underground installation does not have to be inspected.

9. We are replacing the kitchenette cabinets and countertops in the guest suites in a hotel. Will we have to bring it up to the current code like we would in a house? It does have a cooktop. (Chris Dellinger)

Yes.

210.60 Guest Rooms, Guest Suites, Dormitories, and Similar Occupancies.

(A) General. Guest rooms or guest suites in hotels, motels, sleeping rooms in dormitories, and similar occupancies shall have receptacle outlets installed in accordance with 210.52(A) and (D). Guest rooms or guest suites provided with permanent provisions for cooking shall have receptacle outlets installed in accordance with all of the applicable rules in 210.52.

10. When replacing the existing receptacles in a hotel guest suite, do they have to be Tamper Resistant? (Craig Sloop)

Yes 406.4(D)(5); 406.13

406.4(D)(5) Tamper-Resistant Receptacles.

Listed tamper-resistant receptacles shall be provided where replacements are made at receptacle outlets that are required to be tamper-resistant elsewhere in this *Code*.

406.13 Tamper-Resistant Receptacles in Guest Rooms and Guest Suites.

All nonlocking-type, 125-volt, 15- and 20-ampere receptacles located in guest rooms and guest suites shall be listed tamper-resistant receptacles.

*****NOTICE*****

406.4(D)(4)

(4) Arc-Fault Circuit-Interrupter Protection. Where a receptacle outlet is supplied by a branch circuit that requires arc-fault circuit interrupter protection as specified elsewhere in this *Code*, a replacement receptacle at this outlet shall be one of the following:

- (1) A listed outlet branch circuit type arc-fault circuit interrupter receptacle
- (2) A receptacle protected by a listed outlet branch circuit type arc-fault circuit interrupter type receptacle
- (3) A receptacle protected by a listed combination type arc-fault circuit interrupter type circuit breaker

This requirement becomes effective January 1, 2014.

11. I have EMT coming from a trough to a disconnect. I cut my own hole in the trough and the disconnect has concentric knockouts. It is a 480 volt circuit and I pulled an equipment grounding conductor. Do I have to install a bonding bushing at the disconnect? (David Rains)

Maybe

250.97 Bonding for Over 250 Volts. For circuits of over 250 volts to ground, the electrical continuity of metal raceways and cables with metal sheaths that contain any conductor other than service conductors shall be ensured by one or more of the methods specified for services in 250.92(B), except for (B)(1).

Exception: Where oversized, concentric, or eccentric knockouts are not encountered, or where a box or enclosure with concentric or eccentric knockouts is listed to provide a reliable bonding connection, the following methods shall be permitted:

(1) Threadless couplings and connectors for cables with metal sheaths

(2) Two locknuts, on rigid metal conduit or intermediate metal conduit, one inside and one outside of boxes and cabinets

(3) Fittings with shoulders that seat firmly against the box or cabinet, such as electrical metallic tubing connectors, flexible metal conduit connectors, and cable connectors, with one locknut on the inside of boxes and cabinets

(4) Listed fittings

517.19(D) Equipment Grounding and Bonding. Where a grounded electrical distribution system is used and metal feeder raceway or Type MC or MI cable that qualifies as an equipment grounding conductor in accordance with 250.118 is installed, grounding of enclosures and equipment, such as panelboards and switchboards, shall be ensured by one of the following bonding means at each termination or junction point of the metal raceway or Type MC or MI cable:

(1) A grounding bushing and a continuous copper bonding jumper, sized in accordance with 250.122, with the bonding jumper connected to the junction enclosure or the ground bus of the panel

(2) Connection of feeder raceways or Type MC or MI cable to threaded hubs or bosses on terminating enclosures

(3) Other approved devices such as bonding-type locknuts or bushings

12. I was thinking perhaps we could use our code consistency team to come up with an SOP for PV inspections. When we came up with it there was only one type of system being installed residentially and now there are several. (Gerald Barnes)

☑ Building and Electrical permits are required, total job cost (including all equipment) on both electrical permit along with the building permit exceeding \$30,000 will require a NC Licensed General contractor on the building permit.

☑ Contractor will be the safety host and shall provide qualified safety officer and point of attachment for fall protection.

☑ Initial inspection will be scheduled as an IBA due to the added time / necessity of safety issues / host, multiple trade complexities and continuity critical follow through. The initial inspection will require the following:

- a) Plans to be onsite for inspector use. Plans shall include all wire sizes and types, all applicable voltages, amperages and volt-amperes in relation to maximum PV source and output currents, inverter output currents, disconnect locations and grounding details.
- b) Structural engineering report to be given to inspector on first inspection trip.
- c) All manufacturers' installation requirements are required to be on project at inspection times.

☑ Any installer requesting an inspector's signature for a Certificate of Completion for Interconnecting a Generating Facility no larger than 10kw document or similar document will need to obtain a project Certificate of Completion available through the Mecklenburg County website or Documents and Inspections at (704) 336-3830 as inspectors have been instructed not to sign any outside vendor / customer documentation.

***ANY PITCHED ROOF INSPECTION REQUIRES FALL PROTECTION TRAINING AND GEAR. ***

13 . I was turned down for not installing an isolated ground to an isolated grounding type receptacle. Was the inspector correct? (Matt King)

Yes. 406.3(D)(1)

(D) Isolated Ground Receptacles. Receptacles incorporating an isolated grounding conductor connection intended for the reduction of electrical noise (electromagnetic interference) as permitted in 250.146(D) shall be identified by an orange triangle located on the face of the receptacle.

(1) Isolated Equipment Grounding Conductor Required.

Receptacles so identified shall be used only with equipment grounding conductors that are isolated in accordance with 250.146(D).

14. The available fault current coming into the trough from Duke Power is 33K. The electrical contractor has installed a 3 phase 200amp meter box. Inside the meter box the label states that

the meter box is approved for up to 600 volts at 10K. Would this be a code violation or would this fall back onto the utility co.? The voltage is 120/208 3 phase and the load serving the unit is 145 amps. (Gary Mullis)

It is a code violation and would have to be rated equal to or greater than the fault current coming from the utility.

230.66 Marking. Service equipment rated at 600 volts or less shall be marked to identify it as being suitable for use as service equipment. All service equipment shall be listed. Individual meter socket enclosures shall not be considered service equipment.

110.9 Interrupting Rating. Equipment intended to interrupt current at fault levels shall have an interrupting rating not less than the nominal circuit voltage and the current that is available at the line terminals of the equipment.

Equipment intended to interrupt current at other than fault levels shall have an interrupting rating at nominal circuit voltage not less than the current that must be interrupted.

110.10 Circuit Impedance, Short-Circuit Current Ratings, and Other Characteristics.

The overcurrent protective devices, the total impedance, the equipment short circuit current ratings, and other characteristics of the circuit to be protected shall be selected and coordinated to permit the circuit protective devices used to clear a fault to do so without extensive damage to the electrical equipment of the circuit. This fault shall be assumed to be either between two or more of the circuit conductors or between any circuit conductor and the equipment grounding conductor(s) permitted in 250.118. Listed equipment applied in accordance with their listing shall be considered to meet the requirements of this section.

15. Duke energy Talks (Joe Weathers)

16. CE classes (Joe Weathers)

NEXT MEETING:

Contractors - Wednesday June 11, 2014

Inspectors - Wednesday April 11, 2013